



METROPOLITAN
TRANSPORTATION
COMMISSION

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ARTERIAL OPERATIONS COMMITTEE (AOC)

10 A.M. – 12 P.M., Tue, Sept. 14, 2010

Joseph P. Bort MetroCenter
Conference Room 171
101 Eighth Street
Oakland CA 94607-4700

Chair: John Rudolph, WCCTAC
Vice-Chair: Dean Hsiao, San Leandro
Staff Liaison: Vamsi Tabjulu, MTC
Danielle Stanislaus, MTC

The Arterial Operations Committee (AOC) oversees the Bay Area's efforts to improve arterial efficiency and safety. This Committee membership is open to traffic engineers in public and private agencies in the Bay Area. For more information and to download the meeting agenda packets, please visit http://www.mtc.ca.gov/services/arterial_operations/.

AGENDA

1. **Introductions** (Rudolph)
2. **Regional Signal Timing Program (RSTP)*** (Tabjulu)
 - *2009 Cycle Benefit-cost Analysis*
 - *Lawrence Expressway Traffic Responsive System Evaluation*
3. **Program for Arterial System Synchronization (PASS)*** (Tabjulu)
 - *FY 2010/11 Cycle Projects*
4. **Tech Transfer Seminar Program*** (Stanislaus, Tabjulu)
 - *Proposed Seminar Date and Schedule*
 - *Draft Outline for the Arterial/Freeway Integration Seminar*
5. **New Business** (All)
 - *AOC Agenda on MTC Arterial Ops. Website*
 - *Nov. AOC Meeting Date*
 - *Election of AOC Vice-chair at Nov. meeting*
6. **Featured Presentation** – Webster Street Smart Corridor Project** (Obaid Khan, City of Alameda)

* Attachment in the packet

** Handout available at the meeting

**Next Meeting: Tue, Nov. 9, 2010 at 11 A.M., Room 171, or
Tue, Nov. 16, 2010 at 10 A.M., Claremont Room**

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Arterial Operations Committee

Notes from meeting on July 13, 2010

1. Introductions

Attendees introduced themselves. The meeting notes from July 13, 2010 were approved as written.

2. Regional Signal Timing Program (RSTP)

- Vamsi Tabjulu (MTC) stated that all the projects in the 2009 Cycle have been successfully implemented. The final evaluation report on the Traffic Responsive timings implemented on Lawrence Expressway in Santa Clara County would be completed by the end of July. He said that MTC thanks all the local agencies for participating in the consultant performance evaluation surveys which provided important feedback in the selection of consultants for the PASS.

3. Program for Arterial System Synchronization (PASS)

- Vamsi said that the RFQ for the selection of consultants was issued on March 18, 2010 with a due date for SOQ submittals on April 7, 2010. He said that MTC, in partnership with Caltrans, reviewed the seven proposals and interviewed the five shortlisted firms. He outlined the evaluation criteria used by the panel in this selection process. He stated that the MTC Operations Committee approved the staff request to award the contracts to Kimley-Horn & Associates, TJKM Transportation Consultants, and URS Corporation.
- Vamsi stated that the Call for Projects was issued on March 2, 2010 with a due date on April 6, 2010. He stated that MTC, in partnership with Caltrans, reviewed the 16 applications totaling 612 traffic signals. He said that the MTC Operations Committee approved the staff request to provide funding to 13 projects consisting of 342 signals. Danielle Stanislaus (MTC) stated that MTC encourages all agencies to apply for funding in subsequent cycles of the program, as funding will be approved based on the total number of applications received and the funds available.
- Vamsi said that since this is the first cycle of the program, MTC, in consultation with Caltrans, assigned projects to consultants based on equity and their expertise. He said that all the requests from local agencies for a particular consultant couldn't be accommodated, but emphasized that MTC will work closely with all stakeholders to successfully complete the projects.
- Danielle said that the benefit-cost evaluations would be an integral part of the PASS and requested feedback from AOC members on the current Benefit-cost analysis process used in the RSTP. She said that MTC is in the process updating the current process to include transit benefits achieved through signal coordination.

4. Tech Transfer

- Danielle said that MTC is working with Kimley-Horn and Associates to flush out an agenda and identify the potential speakers for the next Tech Transfer seminar on Arterial/Freeway Integration. She requested members to share their ideas and experience to develop the outline for this seminar. Vamsi provided various dates the MetroCenter Auditorium is available in Oct. and said that a tentative reservation would be made to secure the auditorium. He said that a final date will be decided based on the availability of speakers in coordination with Kimley-Horn and Associates.

5. Featured Presentation – I-880 Integrated Corridor Management: Building on Existing Planning Efforts

- Stella So (MTC) provided an overview of the I-880 ICM project, and the presentation is available for download on the MTC website at: http://www.mtc.ca.gov/services/arterial_operations/downloads.htm

6. Adjournment

The meeting adjourned at 11:30 A.M.

Arterial Operations Committee
Attendees from meeting on July 13, 2010

#	Name	Agency	Phone No.	E-Mail
1	Aileen Cabico	URS	408.297.9585	Aileen_cabico@urscorp.com
2	Albert Yee	MTC	510.817.5770	ayee@mtc.ca.gov
3	Alicia Yang	Iteris	949.270.9693	axy@iteris.com
4	Allen Huang	Dowling	510.839.1742	ahuang@dowlinginc.com
5	Ananth Prasad	Santa Clara Co.	408.494.1342	ananth.prasad@rda.sccgov.org
6	Andy Dillard	Danville	925.314.3384	adillard@ci.canville.ca.us
7	Antonino Genoese	CHS Consulting	415.392.9688	agenoese@chsconsulting.net
8	Brian Sowers	Kimley-Horn	925.398.4862	Brian.Sowers@kimley-horn.com
9	Danielle Stanislaus	MTC	510.817.5737	dstanislaus@mtc.ca.gov
10	David Huynh	Fremont	510.494.4484	dhuynh@ci.fremont.ca.us
11	David Kobayashi	VTa	408.321.5892	david.kobayashi@vta.org
12	David Mahama	TJKM	925.463.0611	dmahama@tjkm.com
13	Einar Acuna	Caltrans	510.622.5741	Einar_a_acuna@dot.ca.gov
14	James Watson	AECOM	510.622.6616	james.watson@aecom.com
15	John Rudolph	WCCTAC	510.215.3042	JohnR@ci.san-pablo.ca.us
16	Radiah Victor	MTC	510.817.5719	Rvictor@mtc.ca.gov
17	Robert Paderna	Kimley-Horn	925-398-4872	robert.paderna@kimley-horn.com
18	Stella So	MTC	510.817.5724	Sso@mtc.ca.gov
19	Swathi Korpu	URS	864.643.9673	Swathi_korpu@urscorp.com
20	Vamsi Tabjulu	MTC	510.817.5936	vtabjulu@mtc.ca.gov



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Memorandum

TO: Arterial Operations Committee

DATE: Sept. 7, 2010

FR: Vamsi Tabjulu

W. I. 1234

RE: **Regional Signal Timing Program (RSTP)**

The Regional Signal Timing Program (RSTP) started in 2004 to provide traffic engineering assistance and expertise to local jurisdictions in retiming their traffic signals, including implementing transit signal priority. Technical assistance is provided by consultants retained by MTC. The RSTP program will end with the completion of projects in the 2009 Cycle and is being replaced by the Program for Arterial System Synchronization (PASS).

2009 Cycle Benefit-cost Analysis

All of the projects in this cycle have been successfully implemented including the Traffic Responsive timing plans on Lawrence Expressway in Santa Clara County. In this benefit-cost analysis, results from a total of 556 traffic signals from 11 projects have been included. These results do not include the benefits from the Lawrence Expressway Traffic Responsive System project. The table on next page provides the detailed results of various benefits achieved from all projects in this cycle. The lifetime benefits (5 years) achieved are listed below and demonstrate that the program continues to provide significant mobility and environmental benefits at relatively low costs.

- Travel Time Savings: 2.43 million hours
- Fuel Consumption Savings: 2.83 million gallons
- ROG Emissions Reduction: 40.83 tons
- NOx Emissions Reduction: 15.51 tons
- PM10 Emissions Reduction: 1.94 tons
- CO Emissions Reduction: 170.05 tons
- Total Emissions Reduction: 228.33 tons
- Total Program Costs: \$1,336,204
- Total Lifetime Benefits: \$42,753,265
- **Overall Benefit-cost ratio of 32 : 1**

Note: For definitions and assumptions on this Benefit-cost analysis process, please refer to the Notes at the end of the table on next page.

Regional Signal Timing Program (RSTP) 2009 Cycle : Benefit-cost Analysis														
#	Agency	Consultant	# of Project Signals	Average Speed Increase	Average Decrease in Travel Time	Travel Time Savings (hrs)	Fuel Consumption Savings (gal)	ROG Emissions Reduction (lbs)	NOx Emissions Reduction (lbs)	PM10 Emissions Reduction (lbs)	CO Emissions Reduction (lbs)	Project Cost (2000 \$)	Lifetime Benefits (2000 \$)	Benefit : Cost
1	Fremont	Iteris	22	11%	8%	81,152	122,043	1,473	1,328	130	14,621	\$49,496	\$1,536,411	31 :1
2	Hayward, CT	Iteris	21	9%	7%	124,544	159,440	2,004	2,004	237	17,958	\$54,469	\$2,130,798	39 :1
3	Livermore	Iteris	23	13%	8%	36,352	54,732	654	567	27	6,676	\$44,415	\$686,500	15 :1
4	Danville	Iteris	13	7%	6%	21,779	30,763	360	171	80	4,271	\$29,068	\$407,534	14 :1
5	Santa Clara City, CT	Iteris	16	5%	5%	43,119	55,541	717	780	46	6,504	\$35,776	\$787,601	22 :1
6	Daly City, CT	Iteris	7	24%	16%	30,336	33,066	435	403	43	3,221	\$17,379	\$535,598	30 :1
7	Concord	TJKM	20	12%	8%	139,378	189,419	48,892	3,407	328	22,634	\$45,126	\$2,613,575	57 :1
8	City of Napa	TJKM	18	45%	12%	115,194	144,653	1,898	1,835	205	15,369	\$51,306	\$2,095,460	40 :1
9	Benicia, CT	TJKM	8	41%	13%	27,381	37,231	478	476	39	4,174	\$23,742	\$506,368	21 :1
10	Santa Clara County	KHA	90	10%	6%	860,087	703,595	8,556	4,520	1,236	95,027	\$219,258	\$13,901,243	63 :1
11a	San Jose (Group I)	KHA	71	13%	8%	123,883	143,414	1,861	1,767	188	14,932	\$165,201	\$2,213,773	13 :1
11b	San Jose (Group II)	KHA	99	7%	5%	254,467	367,729	4,445	4,372	420	42,738	\$256,604	\$4,744,563	18 :1
11c	San Jose (Group III)	KHA	67	9%	5%	174,221	244,163	2,994	2,593	311	28,989	\$155,895	\$3,244,601	20 :1
11d	San Jose (Group IV)	KHA	81	14%	9%	396,399	544,555	6,893	6,803	596	62,982	\$188,469	\$7,349,240	38 :1
Total			556			2,428,292	2,830,345	81,659	31,026	3,887	340,095	\$1,336,204	\$42,753,265	32 :1

Notes

- General methodology, fuel consumption factors, and health costs of motor vehicle emissions based on Caltrans' California Life-Cycle Benefit/Cost Analysis Model. Emissions factors obtained from California Air Resources Board, June 2005.
- Benefits claimed include travel time savings, fuel consumption savings, and health cost savings associated with emissions reductions for weekday peak hours only. Unclaimed benefits include the same for additional hours of operation; savings associated with accident reductions and non-fuel vehicle operating costs; and environmental benefits beyond the corridors that were retimed.
- Project life assumed to be five years. Benefits assumed to be 100 percent on first day after implementation, declining steadily to zero by end of the fourth year. Benefits reported under Calculations columns and First Year (Unadj.) Benefits equivalent to total benefits in first year if benefits remained a constant 100 percent. Lifetime (Adj.) Benefits equivalent to sum of discounted average annual benefits, where averages are 90% of First Year (Unadj.) for year 0, 70% for year 1, 50% for year 2, 30% for year 3, and 10% for year 4.
- Value of time assumed to be 50 percent of the wage rate for off-the-clock travel or \$14.20 in 2000 constant dollars. Bay Area average wage rate is \$20.82 per hour in 1990 constant dollars, based on Travel Demand Models for the San Francisco Bay Area [BAYCAST-90] Technical Summary, June 1997. Adjusted for inflation using CPI in 1990 of 132.1 and in 2000 of 180.2, from US Dept of Labor, Bureau of Labor Statistics, CPI - All Urban Consumers, San Francisco-Oakland-San Jose, CA area, All Items, Not Seasonally Adjusted (Series Id:CUURA422SA0). Vehicle fleet assumed to be 100 percent automobiles. Average vehicle occupancy assumed to be one.
- Fuel cost assumed to be average price per gallon of unleaded regular gasoline in 2008 (\$3.80) adjusted for inflation using CPI in 2008 of 223.62 and in 2000 of 180.2, from US Dept of Labor Bureau of Labor Statistics, CPI - Average Price Data, San Francisco-Oakland-San Jose, CA area (Series Id: APUA42274714).
- Discount rate assumed to be three percent.
- Staff cost assumed to be 25 percent of consultant cost, and includes cost of agency staff time for review and implementation of consultant recommendations and program administration.

Lawrence Expressway Traffic Responsive System Evaluation

The County of Santa Clara received a Regional Signal Timing Program (RSTP) grant to develop traffic responsive signal timing for twenty (20) signals on Lawrence Expressway between Sandia Avenue and Saratoga Avenue. This corridor carries a significant amount of commuter traffic, and is adjacent to freeways (I-280, US-101, SR-237) and many shopping centers. The corridor has significant differences in peak hourly volumes in comparison to the traffic volumes just outside of the peak hour. In addition, the corridor has significant changes in seasonal volume and is affected by incidents on the freeways.

Traffic responsive timing is a method of providing signal coordination by enabling signal timing plans through actual traffic volumes along the corridor as opposed to plans being enabled at specific times during the day. Traffic volumes and loop detector occupancy data are continuously measured along the corridor and then a specific coordination plan is selected from a “bank” of plans based on those volumes and occupancy. Traffic responsive operation allows the system to select the most appropriate plan based on the actual traffic conditions and to respond to daily, weekly, and monthly traffic fluctuations. Therefore, coordination will operate during only those times at which it is needed and with the most appropriate timing plan, resulting in reduced delay, vehicle emissions, and improved safety. An analysis of the traffic responsive operations was conducted to establish the timing patterns and responsive parameters for the system. The analysis included the following steps:

- Data collection of detector data and existing timing plan information
- Evaluating signal groups
- Determining time of operation for traffic responsive implementation
- Selection of system detectors
- Review of existing patterns and development of additional patterns
- Development of responsive parameters and threshold values

Once the timing patterns and responsive parameters were developed, the County deployed the responsive software and input the timings into the system. The initial fine-tuning process consisted of bench testing the system by running the operation in the office without deploying it in the field. During the office fine-tuning, various responsive parameters were adjusted, such as threshold values, to calibrate the system prior to field deployment. Initial office fine-tuning was completed primarily by County staff with assistance from Kimley-Horn.

Once the system was calibrated in the office, the system was deployed in the field. The fine-tuning primarily consisted of watching the operations from the County Traffic Operations Center (TOC) by monitoring how the system was deploying patterns and adjusting settings to have proper plans in place based on volume conditions. In addition, the timing patterns themselves were fine-tuned. New timing patterns were developed if it was determined there was not a sufficient number of plans to respond to traffic conditions, or the timing patterns were fine-tuned by adjusting offsets and splits for each plan. Also, the time of operation of the traffic responsive system was adjusted to expand its operation into some of the peak periods.

As shown in the study results, traffic responsive operation provided significant benefits over and above time-of-day operations as the responsive timing was able to respond to the varying traffic volume conditions, especially during off-peak periods. It is anticipated that corridors similar to

Lawrence Expressway would benefit from traffic responsive operation and should be considered for future projects.

Benefit-Cost Analysis Summary

The table below summarizes the total project savings and total project costs, and the resultant benefit-cost ratio. For definitions and assumptions on this Benefit-cost analysis process, please refer to the Notes at the end of the table.

Benefits				
Savings	First Year		Lifetime (5 years)	
	Savings	Monetary Savings	Savings	Monetary Savings
Travel Time Savings	82,470 hrs	\$1,474,560	191,780 hrs	\$3,560,030
Fuel Consumption Savings	86,280 gals	\$257,990	200,640 gals	\$622,860
NOx Emissions Reduction	1.63 tons	\$28,190	3.79 tons	\$68,050
CO Emissions Reduction	9.26 tons	\$690	21.54 tons	\$1,650
VOC Emissions Reduction	1.51 tons	\$1,830	3.52 tons	\$4,430
Total Benefits (in 2010 constant dollars)				\$4,257,030
Costs				
County Staff Cost				\$37,460
Traffic Responsive Module and Training Costs				\$10,620
Consultant Cost				\$25,995
Total Costs (in 2010 constant dollars)				\$74,075
Benefit/Cost Ratio				58:1

Notes:

- General methodology, fuel consumption factors, and health costs of motor vehicle emissions based on California Department of Transportation, Office of Transportation Economics. California Life-Cycle Benefit/Cost Analysis Model and Technical Supplement to the User's Guide, 2009.
- Benefits claimed include travel time savings, fuel consumption savings, and health cost savings associated with emissions reductions for weekday only. Yearly savings calculated based on 250 days of workday in a year.
- Value of time assumed to be 50 percent of the wage rate for off-the-clock travel or \$17.88 in 2010 constant dollars. Bay Area average wage rate is \$20.82 per hour in 1990 constant dollars, based on Travel Demand Models for the San Francisco Bay Area [BAYCAST-90] Technical Summary, Table 4, p. 28, June 1997. Adjusted for inflation using CPI, from US Dept of Labor, Bureau of Labor Statistics, CPI - All Urban Consumers, San Francisco-Oakland-San Jose, CA area, All Items, Not Seasonally Adjusted (Series Id:CUURA422SA0). Vehicle fleet assumed to be 100 percent automobiles. Average vehicle occupancy assumed to be one.
- Fuel cost assumed to be \$2.99 per gallon, from US Dept of Labor Bureau of Labor Statistics, CPI - Average Price Data, San Francisco-Oakland-San Jose, CA area, Gasoline unleaded regular per gallon. Average of monthly prices in the Bay Area from July 2009 – June 2010.
- Health cost of NOx Emissions (\$17,298 per ton) and CO Emissions (\$74 per ton) are based on the California Department of Transportation, Office of Transportation Economics from Exhibit III-41, p. III-64 of the year 2007. The 2010 costs are calculated with a standard assumption of 2% increase per year from the 2007 costs.
- Project life assumed to be five years. Benefits assumed to be 100 percent on first day after implementation, declining steadily to zero by end of the fourth year. Benefits equivalent to sum of discounted average annual benefits, where averages are 90% of First Year for year 0, 70% for year 1, 50% for year 2, 30% for year 3, and 10% for year 4.
- County staff cost assumed to be \$120/hr (for Senior Electrician) for 120 hours and \$144 (for Associate Civil Engineer) for 160 hours.
- 15% of the Traffic Responsive Module and Training Cost was assumed for this project (total costs: \$70,794)



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Memorandum

TO: Arterial Operations Committee

DATE: Sept. 7, 2010

FR: Vamsi Tabjulu & Danielle Stanislaus

W. I. 1234

RE: **Program for Arterial System Synchronization (PASS)**

The purpose of the Program for Arterial System Synchronization (PASS) is to provide technical and financial assistance to Bay Area agencies to improve the safety and efficiency of the operations of certain traffic signal systems/corridors. The Transportation 2035 Plan provides approximately \$1.25 million per year in CMAQ funds for traffic signal coordination. The PASS provides traffic engineering assistance to local jurisdictions in retiming their traffic signals, including transit signal priority, incident management flush plans, traffic responsive timing plans, and establishing communication between state and local signals. MTC will administer and manage this program, but the primary responsibility for the operation and retiming of traffic signals resides with the agency that owns them. Projects are defined by local agencies, evaluated by MTC staff, and assigned to consultants retained by MTC. The PASS guidelines are available on the MTC Arterial Operations website at: http://www.mtc.ca.gov/services/arterial_operations/

FY 2010/11 Cycle Projects

This cycle has a total of 13 projects consisting of 341 traffic signals from seven counties in the Bay Area. In July and August the kick-off meetings were completed for all the projects except for the Santa Clara County project. The consultants helped coordinate these meetings with MTC, Caltrans and local agencies, and have submitted the Draft Detailed Workslope Schedule and Budgets (DWSBs). MTC, in partnership with Caltrans and local agencies, is in the process of reviewing these DWSBs. More accurate cost estimates and services for all the projects will be available once the DWSBs are finalized.

In this first cycle of the program, there are a total of 70 Caltrans signals that will be coordinated with over 270 local agency signals in various projects. In order to provide a common time source to enable signal coordination between the state and local signals, the guidelines allow for the procurement of GPS clocks. MTC is in the process of procuring over 30 GPS clocks required for these projects. Considering the resource constraints at Caltrans, many of the local agencies have agreed to secure Caltrans encroachment permits to install the GPS clocks. MTC and the consultants will assist the local agencies through this permit process. The Caltrans signal operations staff will be present during the installation to assist with the configuration of the clocks. These steps will enable the coordination of state and local signals and provide for signal coordination during weekday peak periods along some major arterials in the Bay Area.

The Scope of Services for the projects will be conducted in accordance to the *Standard Scope of Work* for PASS Consultants and based on discussions with the Agencies involved in the project. The PASS Standard Workscope, Schedule and Budget, and Project Administration Guidelines are located at: http://www.mtc.ca.gov/services/arterial_operations/

The table below shows all the projects in this cycle, the services approved and the consultant assigned to these projects.

Program for Arterial System Synchronization (PASS) 2010/11 Projects					
#	Sponsor Agencies	Signals		Services ¹	Consultant
		Caltrans	Total		
1	Fremont, Caltrans	4	8	WSC	Kimley-Horn
2	San Leandro, Caltrans	1	10	WSC	Kimley-Horn
3	Redwood City, Caltrans	1	8	WSC	Kimley-Horn
4	Livermore	0	19	WSC, IM, TSP	Kimley-Horn
5	Santa Clara County	0	86	TR	Kimley-Horn
6	Union City, Hayward, Caltrans	2	18	WSC	TJKM Consultants
7	Petaluma, Caltrans	7	12	WSC	TJKM Consultants
8	Fairfield, Caltrans	5	21	WSC	TJKM Consultants
9	South San Francisco, Caltrans	5	8	WSC	TJKM Consultants
10	Santa Rosa, Caltrans	7	30	WSC, ST	TJKM Consultants
11	Napa, Caltrans	25	30	WSC	TJKM Consultants
12	Alameda, Caltrans	1	4	WSC	URS Corporation
13	Walnut Creek, Caltrans	12	87	WSC, IM	URS Corporation
TOTAL		70	341		

¹ WSC – Weekday (AM/ MD/PM) Signal Coordination Timing Plans; TR – Traffic Responsive Timing Plans; IM – Incident Management Flush Plans; TSP - Transit Signal Priority; ST – School Peak Timing Plans



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Memorandum

TO: Arterial Operations Committee

DATE: Sept. 7, 2010

FR: Danielle Stanislaus, Vamsi Tabjulu

W. I. 1234

RE: **Tech Transfer Seminar Program**

The Tech Transfer Program is an ongoing initiative under MTC's Arterial Operations Program, which supports efforts to improve the operations, safety, and management of the Bay Area's arterial network. Through the Tech Transfer Program, MTC retains a consultant to assist in developing and providing seminars on a variety of topics of interest to local traffic engineers. These presentations from the previous Tech Transfer Seminars are available on the MTC website at: http://www.mtc.ca.gov/services/arterial_operations/downloads.htm.

Arterial/Freeway Integration Seminar

The draft outline developed by Kimley-Horn and Associates is attached for AOC members to review on the next page. Please provide your comments and suggestions on this outline. Members are requested to suggest other relevant projects and/or people with expertise in Arterial/Freeway Integration at the Sept. AOC meeting or provide comments via email to vtabjulu@mtc.ca.gov by Sept 17th.

Proposed Date and Schedule

The MTC Auditorium is currently reserved for the afternoon of Nov. 9 (Tue), but the Auditorium is also available on the following dates: Nov. 1 (Mon), Nov. 8 (Mon), and Nov. 22 (Mon). Please let us know if any of the above dates conflict with any holidays or technical conferences. The seminar date will be finalized based on the availability of potential speakers.

1:00 – 1:15pm	Introductions
1:15 – 2:00pm	Seminar Introduction (including Q&A)
2:00 – 2:45pm	Project Example 1 (including Q&A)
2:45 – 3:00pm	Break
3:00 – 3:45pm	Project Example 2 (including Q&A)
3:45 – 4:30pm	Project Example 3 (including Q&A)

Draft Outline for Arterial/Freeway Integration Seminar

Note: All the proposed speakers listed in this draft outline have not yet been contacted/requested to participate in this seminar.

I. Seminar Introduction

A brief introduction will be provided by speakers from Kimley-Horn and Associates, Caltrans and/or MTC on the recent, current, and upcoming programs and initiatives for Arterial/Freeway Integration.

- Potential topics
 - Freeway Performance Initiative (FPI)
 - Integrated Corridor Management (ICM)
 - Active Traffic Management
 - Incident Management
 - Express Lanes (HOT Lanes)
 - Ramp Metering
 - Program for Arterial System Synchronization (PASS)
- Potential speakers
 - TBD

II. Examples of Arterial/Freeway Integration

Each example of arterial/freeway integration will be asked to discuss details of their project, which may include at a minimum:

- | | |
|--------------------------------|--------------------------------|
| ▪ Data needs | ▪ Coordination needs |
| ▪ Software needs | ▪ Maintenance responsibilities |
| ▪ Traveler information needs | ▪ Policy issues |
| ▪ Resource needs | ▪ Agreements |
| ▪ Technology choices | ▪ Project costs |
| ▪ Design & equipment standards | |

I. C/CAG San Mateo US-101 Smart Corridor Project

- Potential speakers
 - Richard Napier (C/CAG)
 - Larry Patterson (City of San Mateo)

II. I-80 Integrated Corridor Management Project

- Potential speakers
 - John Hemiup (ACCMA)
 - Hisham Noeimi (CCTA)
 - Yvette Ortiz (El Cerrito)

III. Santa Clara County Ramp Metering Project

- Potential speakers
 - David Kobayashi (VTA)
 - Dennis Ng (Santa Clara)